



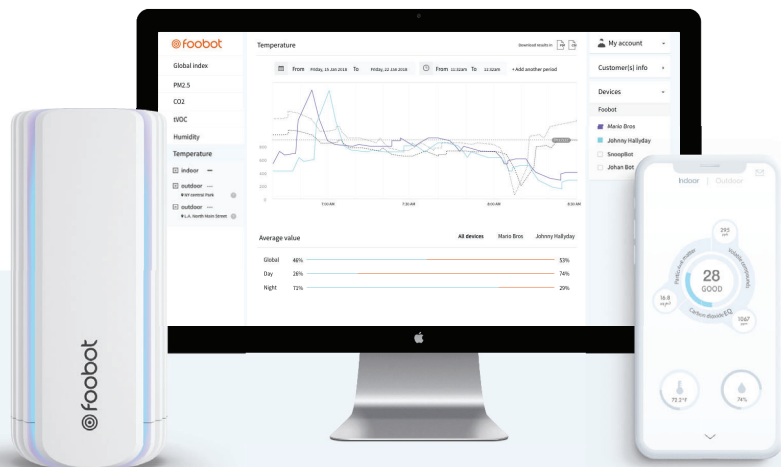
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# Sensors & machine learning to improve HVAC control

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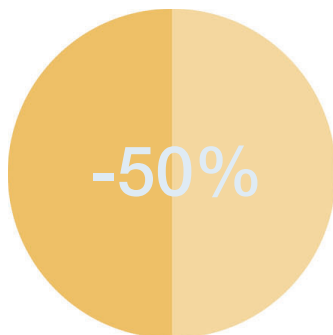
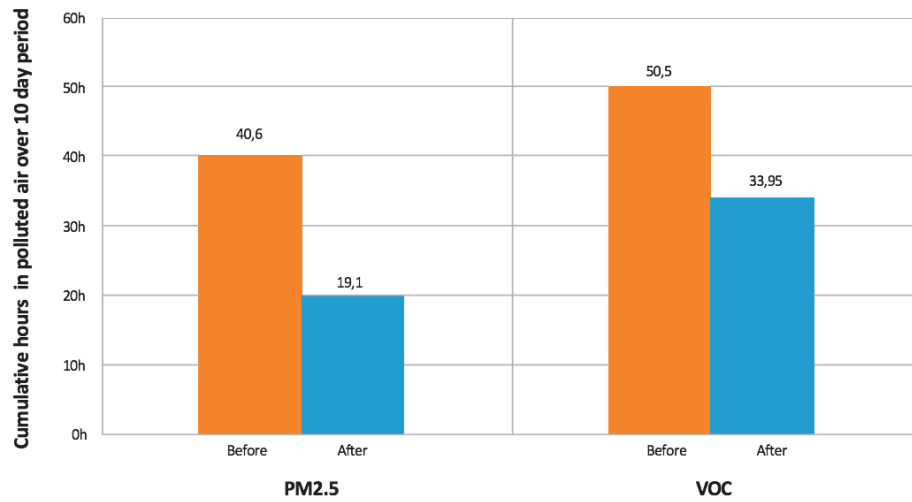
## Our first product, Foobot

First connected air quality sensor measuring beyond CO2

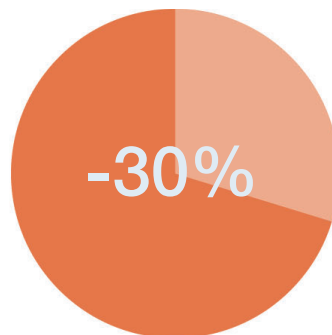




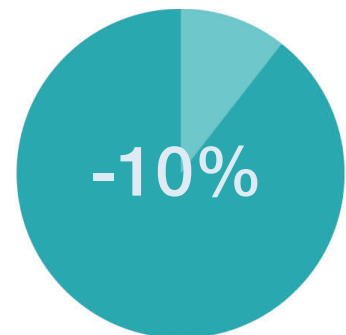
Based on the first 100 Foobots connected with Nest



PM2.5



VOCs



DCV

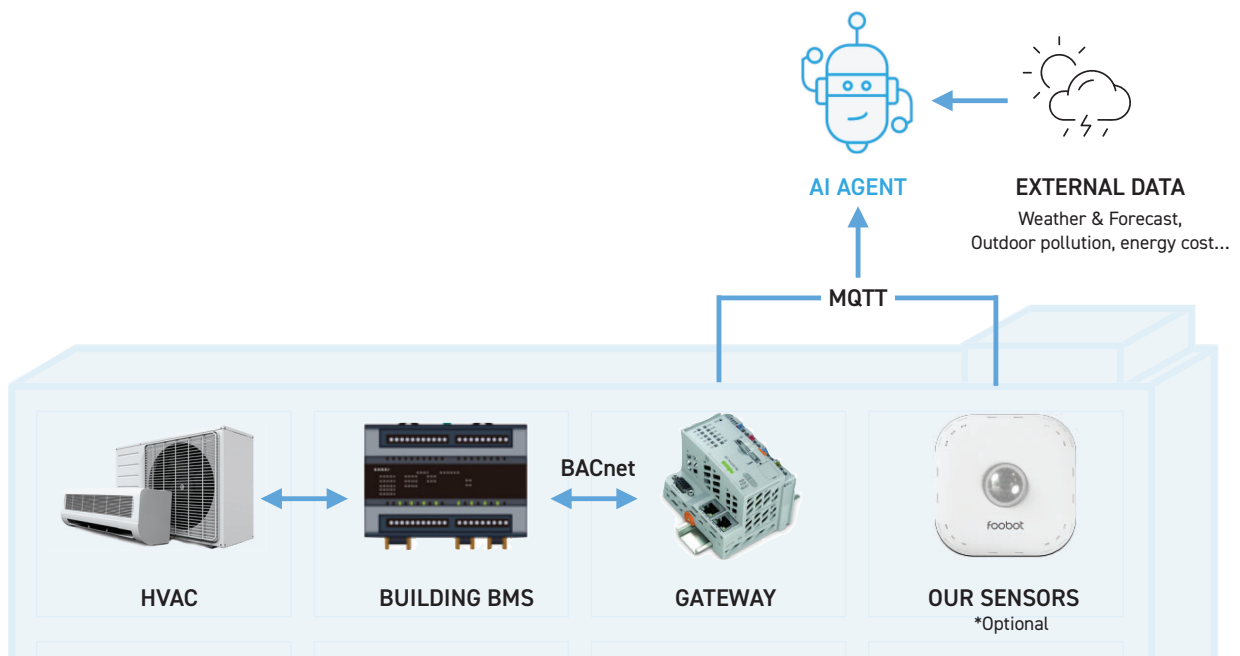


# Smart Air Building

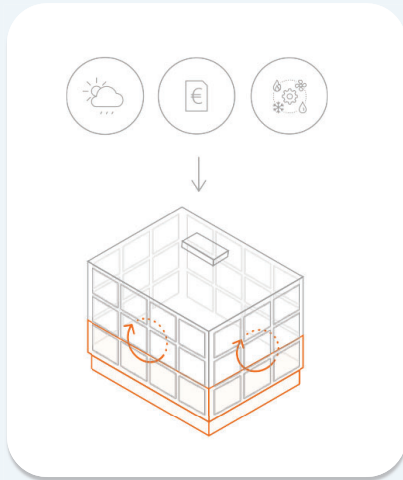
## HVAC Optimization for

- ↘ Carbon Footprint
- ↗ Indoor Air Quality

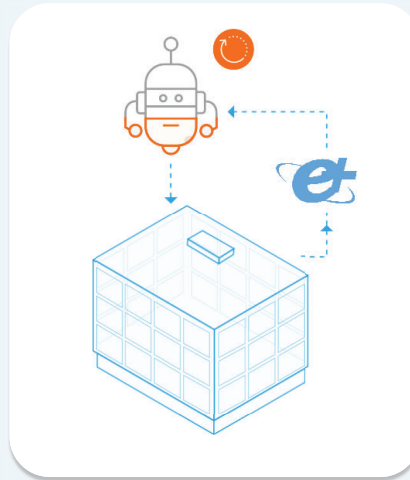
## Deployment of SAB



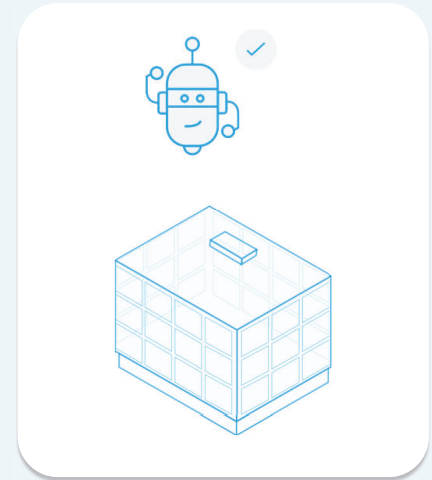
# Pre-Training Technology



Building model

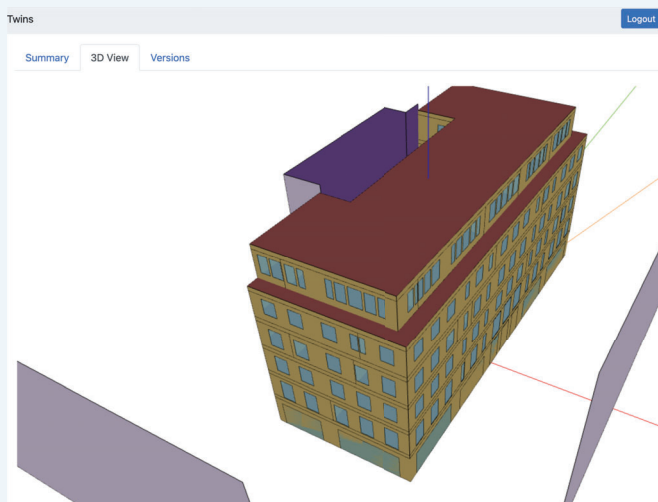


Simulation



AI agent trained

## Building Model > Digital Twin



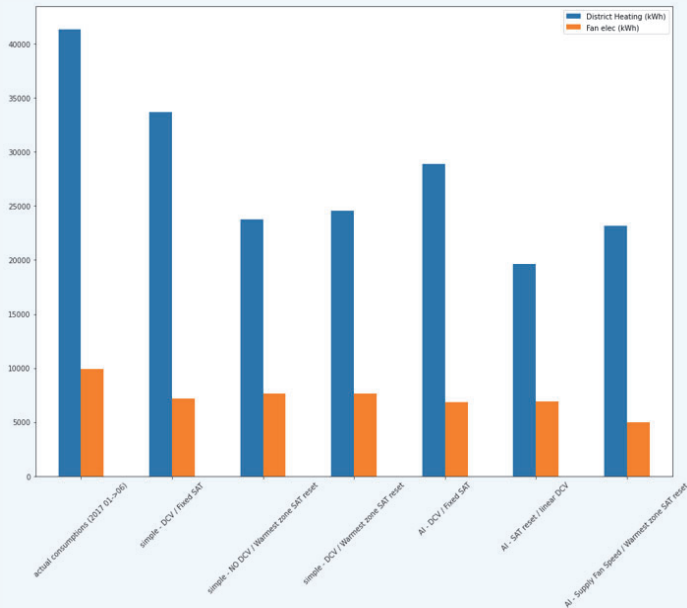
### Open Studio model

Building envelope, HVAC system, local outdoor conditions

### Model Calibration

Align real life data with model data, following ASHRAE 14 standard

# Reinforcement Learning



## EnergyPlus simulation

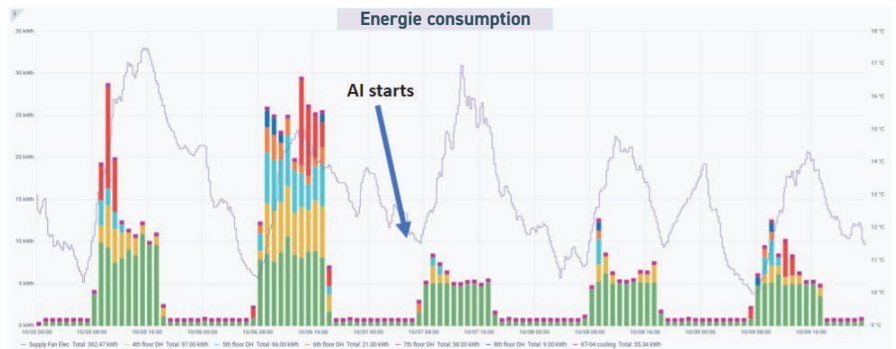
Digital twin, OpenAI Gym

## Agent selection

Benchmark control strategy and agents

## Ability to predict results

# Results in our first building



**52.6%**  
Energy savings  
From HVAC



**98.9%**  
Thermal comfort  
Delivered



**100%**  
CO<sub>2</sub> & IAQ  
Below threshold\*

# Indoor Air Quality

measured by FoobotSAT



## Sensors

tVOC  
PM1 / 2.5 / 10  
CO2  
T/H  
Motion

## Connectivity

BLE / WiFi / Ethernet

## Power

AC adaptor / POE



8 real-time measures of Indoor Air Quality and Thermal Comfort

## Smart Air Building result summary



**3.35€/m²**

**SAVED**

over 12 months



**62 tCO<sub>2</sub>**

**AVOIDED**

over 12 months



**5 months**

**RETURN**

on investment

**- 51 625€** energy savings over 12 months



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## Before we go

- Reach out if you want SAB deployed in your building!
- Check our tech article explaining how we can save so much energy:  
<http://bit.ly/foobot-ai>

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